NEC

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# NEAX®2000 IVS²

## INTEGRATED VOICE SERVER

## Q-SIG System Manual

JULY, 2000

NEC America, Inc.

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# NEAX2000 IVS$^2$
# Q-SIG System Manual

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# INTRODUCTION

## PURPOSE

This manual describes the hardware installation and programming procedure for the Q-SIG System on the NEAX2000 $IVS^2$.

## OUTLINE OF THIS MANUAL

This manual consists of the following chapters:

CHAPTER 1 GENERAL INFORMATION
This chapter explains the Q-SIG system outline, system configuration, the name and functions of circuit cards required, system capacity, system conditions, and available service features.

CHAPTER 2 INSTALLATION
This chapter explains the hardware installation procedure to provide Q-SIG interface on the PBX.

CHAPTER 3 SYSTEM DATA PROGRAMMING
This chapter explains the programming procedure to provide Q-SIG feature on the PBX.

CHAPTER 4 CIRCUIT CARD INFORMATION
This chapter explains the mounting location, the meaning of lamp indications, and the method of switch settings of each circuit card for the Q-SIG.

# REFERENCE MANUALS

Refer to the following manuals during installation:

| | |
|---|---|
| Installation Procedure Manual: | Describes the installation procedure of the PBX system. |
| Command Manual: | Describes Customer Administration Terminal (CAT) operation, command function and setting data required for programming the system, and Resident System Program. |
| Office Data Programming Manual: | Contains the Customer Specification Sheet and Office Data Programming Sheet. |

# CHAPTER 1

# GENERAL INFORMATION

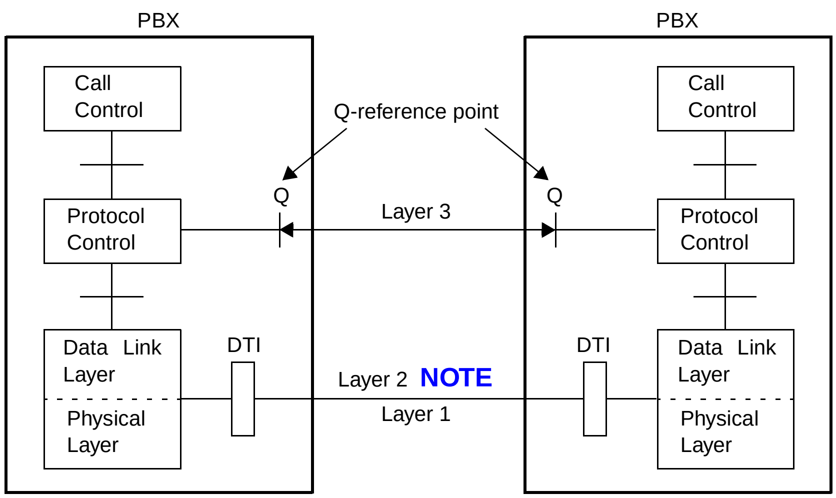
This chapter explains the Q-SIG system outline, system configuration, the name and functions of circuit cards required, system capacity, system conditions, and available service features.

# SYSTEM OUTLINE

## Summary

This feature allows the PBX to provide basic connection service for interfacing with the other PBX by using Layer 3 protocol which conforms to ETS 300 172. ETS 300 172 is standardized for private telecommunication network as Inter-exchange signaling protocol for circuit mode basic services by European Telecommunication Standards Institute (ETSI). The Q-SIG protocol creates Layer 3 messages between Q reference points expected as conceptual point for inter-office signalling.

**Figure 1-1 System Outline of Q-SIG**



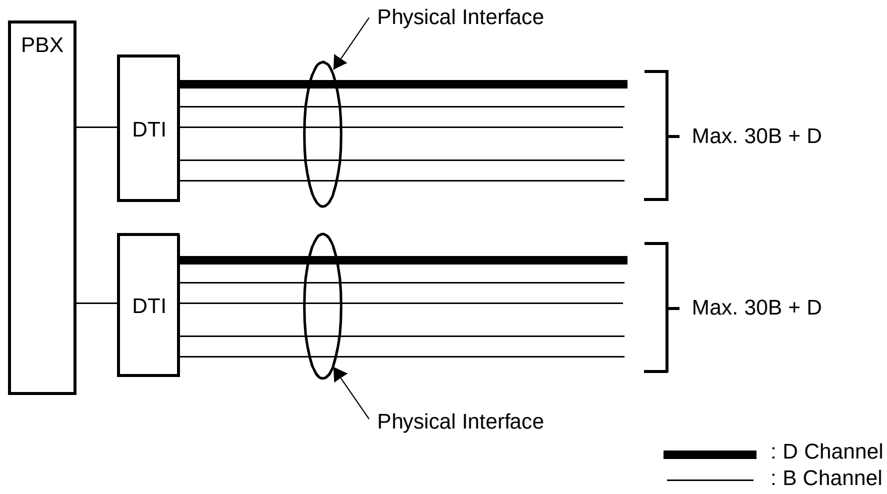

**NOTE:** Conforming to Q921-a (PBX-PBX Interface)

## Physical Interface 30DTI

On the Q-SIG system, a 2 Mbps digital interface is used for the interface trunk.

A D Channel Handler is required for each physical interface. A single data link channel can control a maximum of 30 B Channels.

### Figure 1-2 Physical Interface

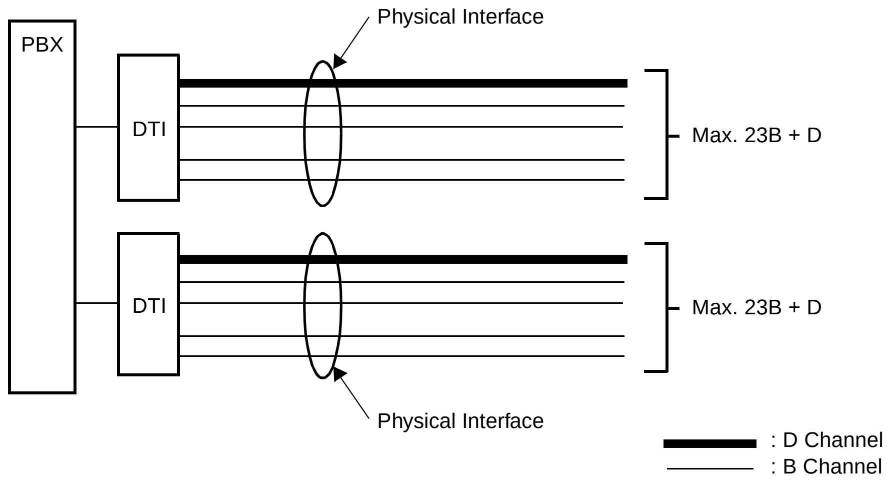



## Physical Interface 24DTI

On the Q-SIG system, a 1.544 Mbps digital interface is used for the interface trunk.

A D Channel Handler is required for each physical interface. A single data link channel can control a maximum of 23 B Channels.

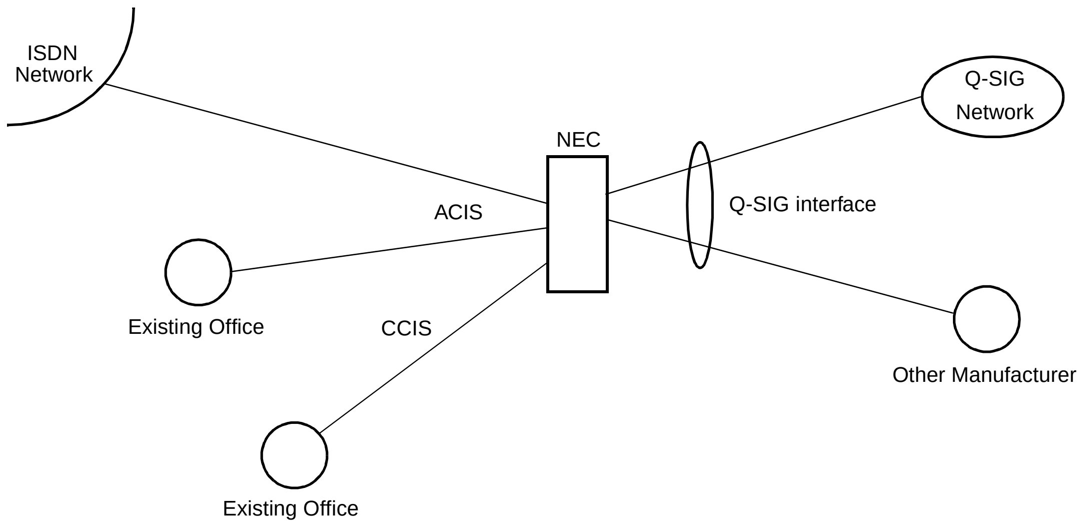
### Figure 1-3 Physical Interface



## Interworking with Other Network

The PBX can be connected with the other manufacturer's PBX by the Q-SIG interface, and the Q-SIG network can interwork with the other network.

**Figure 1-4 Interworking with Other Network**

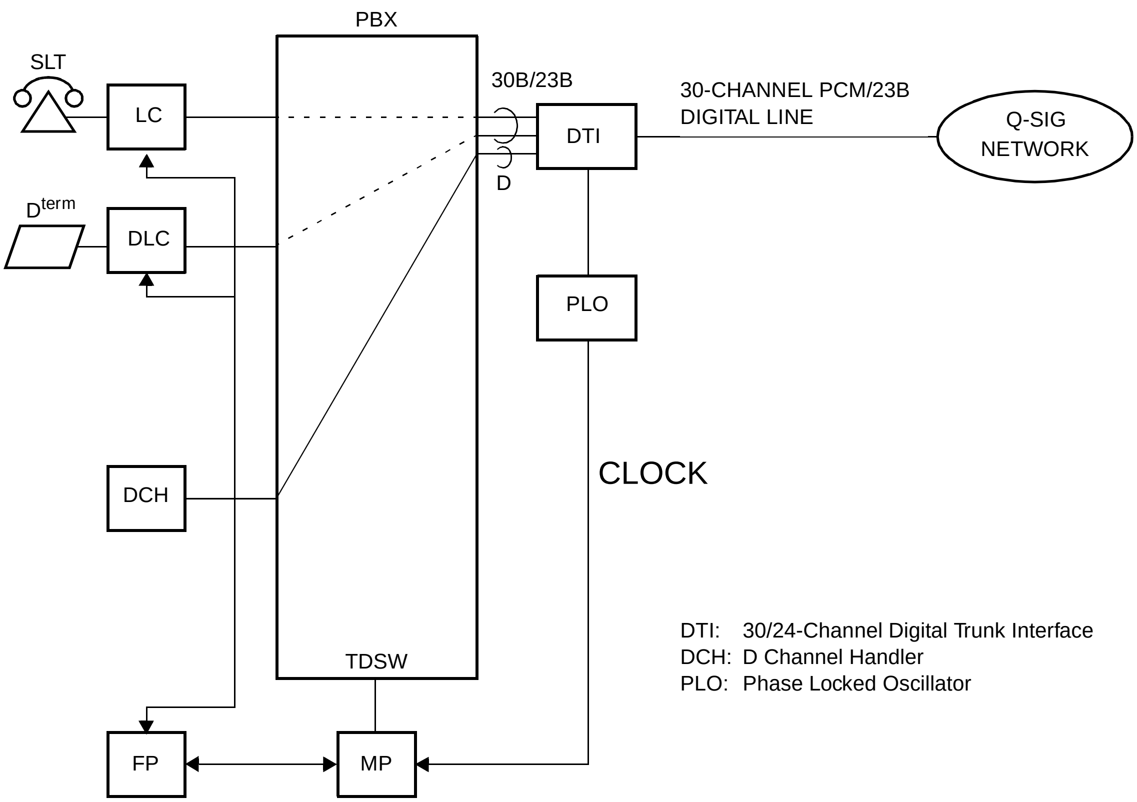



**NOTE:** Interworking between Q-SIG and CCIS is not available.

# SYSTEM CONFIGURATION

Figure 1-5 shows the system configuration of the Q-SIG system.

**Figure 1-5 System Configuration of Q-SIG**




DTI: 30/24-Channel Digital Trunk Interface
DCH: D Channel Handler
PLO: Phase Locked Oscillator

## 30DTI

The Digital Trunk Interface (DTI) interfaces the PBX directly to 30-channel PCM transmission line. The 30-DTI has the following functions.

- Unipolar/Bipolar Conversion (HDB3 Format)
- Signaling Insertion/Extraction
- Alarm Detection/Insertion
- Digital PAD on Voice Signal Transmission
- Cyclic Redundancy Checking (based on ITU-T Rec. G704)
- Channel Associated Signaling (based on ITU-T Rec. Q421 Digital R2 Signaling Code)

For connection of a 30-DTI and transmission line, either coaxial cable or twisted pair cable can be used.

## DCH

The D Channel Handler (DCH) provides the D Channel signaling interface through the DTI to a Q-SIG network, and it is responsible for signaling between the PBX and the network under control of the system MP.
A DCH can control a maximum of 30 B Channels.

## 24DTI

The Digital Trunk Interface (DTI) interfaces the PBX directly to 24-channel PCM transmission line. The 24-DTI has the following functions.

- Unipolar/Bipolar Conversion (AMI Format)
- Alarm Detection/Insertion
- Digital PAD on Voice Signal Transmission
- Cyclic Redundancy Checking (based on ITU-T Rec. G704)

For connection of a 24-DTI and transmission line, a twisted pair cable can be used.

## DCH

The D Channel Handler (DCH) provides the D Channel signaling interface through the DTI to a Q-SIG network, and it is responsible for signaling between the PBX and the network under control of the system MP.
A DCH can control a maximum of 23 B Channels.

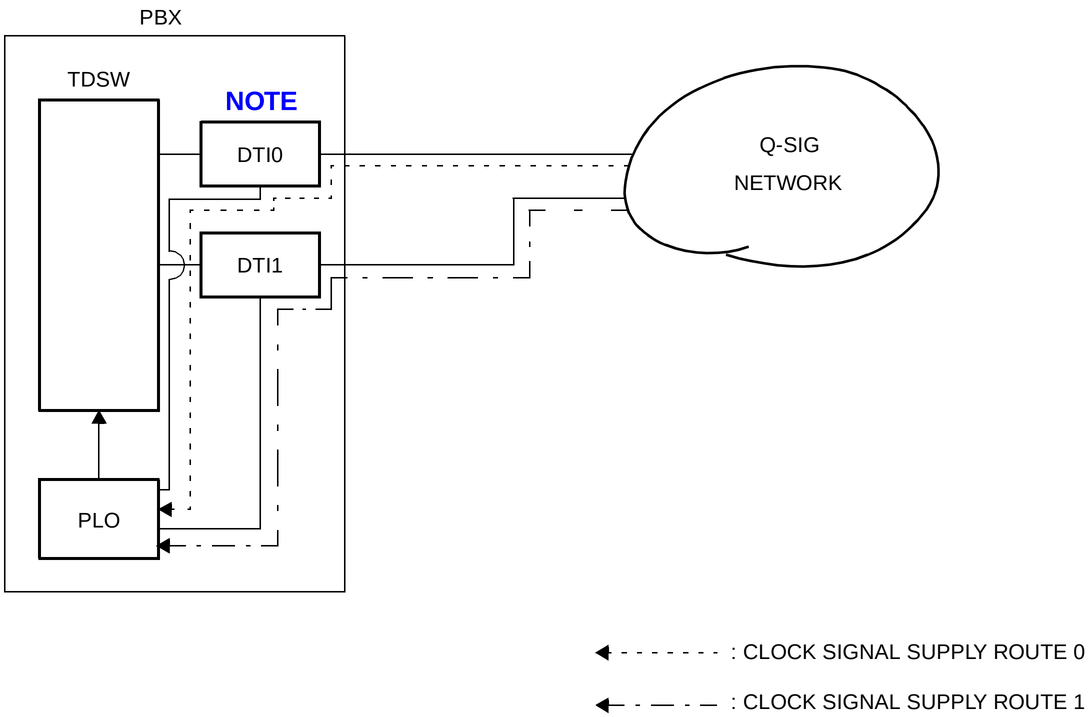
## PLO

The Phase Locked Oscillator (PLO) equipped on the MP card is responsible to synchronize the system to Q-SIG clocks.

The PLO generates the clock signals according to the source clocks received from network. The source clock signals are extracted at DTI cards and supplied to the PLO. Two clock routes are available; one is the Route 0 to receive clock signals from DTI0, and the other is a standby Route 1 (DTI1) to receive clock signals when no clock signals appear on the Route 0. When clock signals come from neither the Route 0 nor the Route 1, the PLO keeps generating the clock signals with the frequency of previous source clock. The PLO can receive different frequency of source clocks from the Route 0 and Route 1.

Figure 1-6 shows an example of clock supply route.

**Figure 1-6 Clock Supply Route Configuration**




**NOTE:** DTI0 and DTI1 must be mounted in PIM0.

# CARD NAME AND FUNCTION

Table 1-1 shows the circuit card name and function for Q-SIG.

**Table 1-1 Q-SIG Card Name and Function**

| CARD NAME | FUNCTIONAL NAME | FUNCTION |
|---|---|---|
| PN-CP14 | MP | Main Processor Card<br>Provides Memory, TDSW (1024CH x 1024CH), 16-line CFT, PB sender, Clock, PLO 2 ports (receiver mode/ source mode), two RS-232C ports, 2-line DAT (Recording duration: Max. 128 sec.), DK, 4-line PB receiver, Modem for remote maintenance (19.2 kbps), internal Music-on-Hold tone source and BUS interface.<br>BUS interface functions as a driver/receiver of various signals, adjusts gate delay timing and cable delay timing, monitors I/O Bus and PCM BUS.<br>One card is required per system. |
| PN-30DTC-A | DTI | Digital Trunk Interface (2 Mbps) Card<br>Accommodates 30-channel PCM digital lines. |
| PN-SC01 | DCH | D Channel Handler Card<br>Provides the D Channel signaling interface through the DTI to Q-SIG network. |
| PZ-M542<br>**[For Other Countries]** | CONN | Coaxial Cable Connection Card<br>Used to connect a coaxial cable for the Digital Trunk Interface.<br>Maximum of two cards can be connected to LTC connector of each PIM. |
| PZ-M557<br>**[For Australia]** | CONN | Coaxial Cable Connection Card<br>Used to connect a coaxial cable for the Digital Trunk Interface.<br>Maximum of two cards can be connected to LTC connector of each PIM. |
| PN-24DTA-C | DTI | Digital Trunk Interface (23B+D 1.5 Mbps) card<br>Accommodates 24-channel PCM digital lines. |

# SYSTEM CAPACITY

**Table 1-2 System Capacity for Q-SIG**

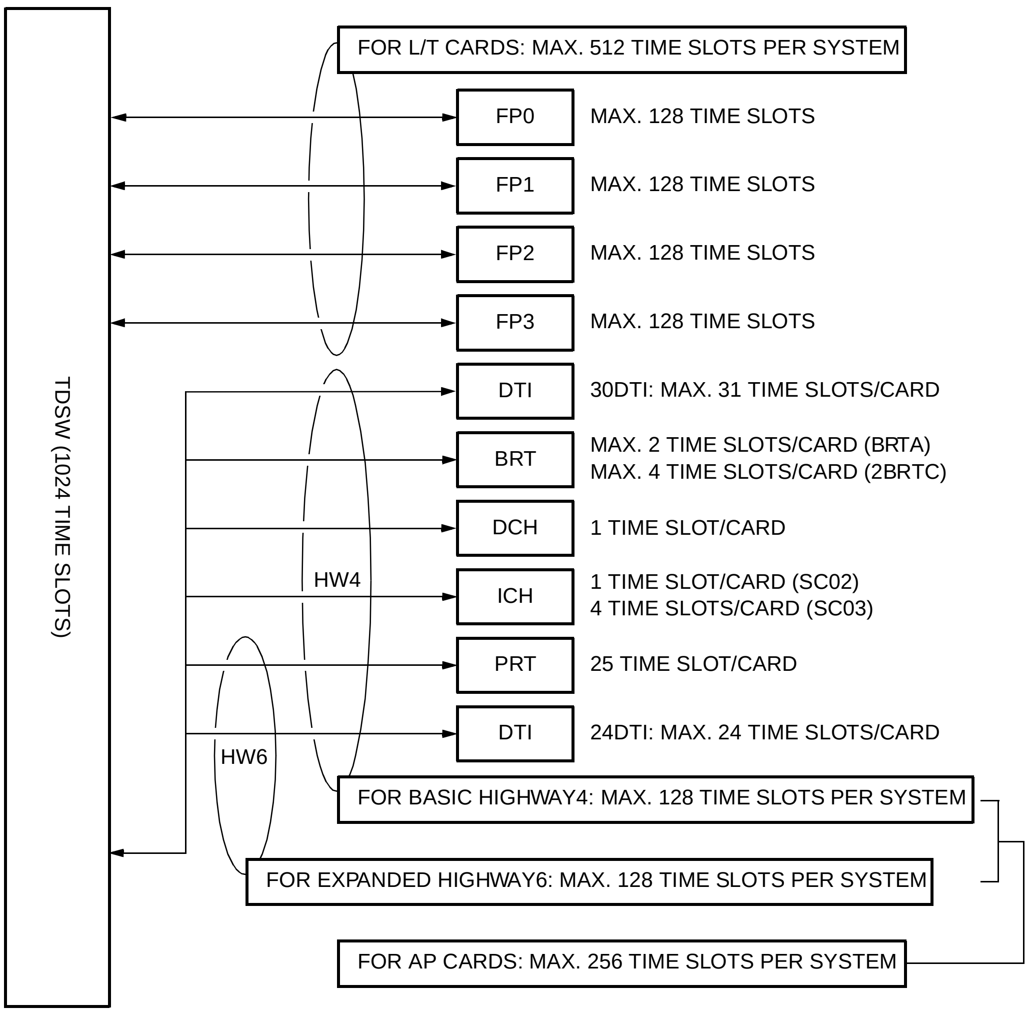
| DESCRIPTION | 24DTI | 30DTI |
|---|---|---|
| DTI Card | 8 | 4 |
| DCH Card | 8 | 4 |
| Trunks for DTI | 192 | 124 |
| Q-SIG Routes | 8 | 4 |
| Trunks per Q-SIG Route | 23 | 30 |
| MP (Internal PLO) Card | 1 | 1 |
| Port per DTI Card | 24 | 32 |
| Port per DCH Card | 1 | 1 |

# SYSTEM CONDITIONS

## Time Slot Assignment Condition

As shown in Figure 1-7, the 30DTI/DCH card uses the time slot on the basic Highway 4. Therefore, the total number of time slots for all 30DTI/DCH cards must be 128 time slots or less including all other application processor cards, which use the Highway 4.
The 24DTI/PRT card can use the time slot on both the basic and expanded Highway 4 and 6.

**Figure 1-7 Accommodation of DTI/DCH/ICH/BRT/PRT into TDSW**



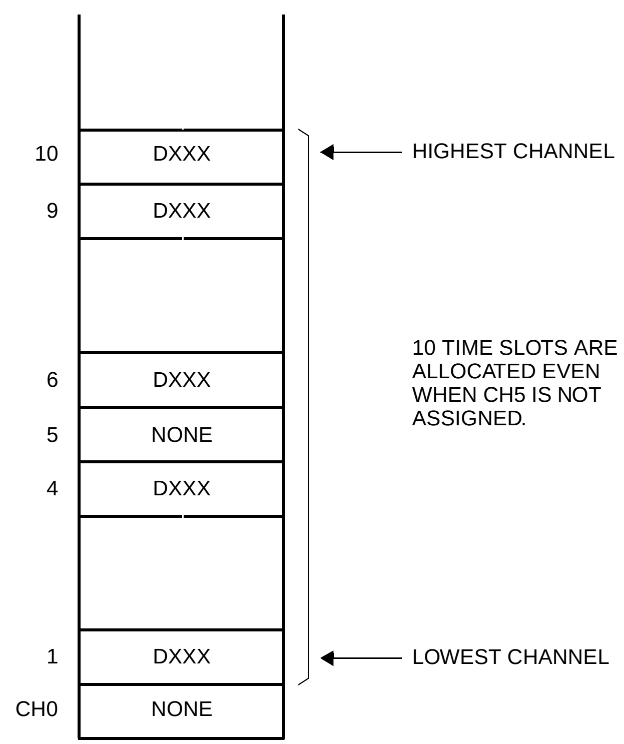
## Time Slot Allocation for DTI/DCH Card

On each DTI card, the system recognizes the lowest and highest channel numbers to which trunk numbers have been assigned, and allocates time slots to all the channels within them. If trunk numbers are assigned to discontinuous channels in this case, the system also allocates time slots to channels not assigned.

For example, as shown in Figure 1-8, even when Channel 1 through Channel 10 have been assigned by the system data programming (CM07 YY=01) excepting Channel 5, the system allocates a total of 10 time slots for all the ten channels. Therefore, to avoid allocation of unnecessary time slots, it is recommended that consecutive channels are assigned on each DTI card.

In the case of the DCH card, one time slot is allocated for setting up a fixed path between the DTI and the DCH by assigning Channel 16 of the DTI as the D Channel.

**Figure 1-8 Time Slot Allocation for DTI**

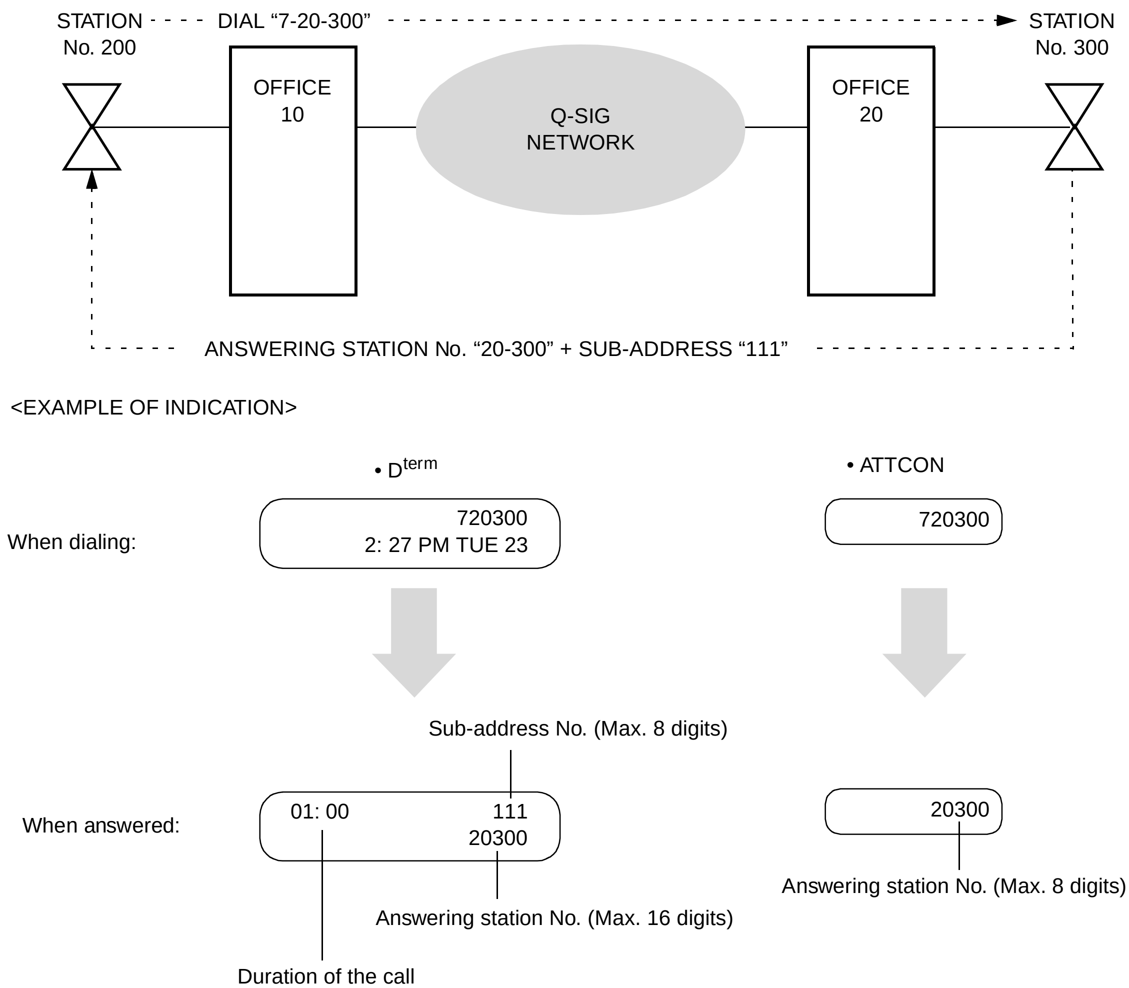


# SERVICE FEATURES

## Connected Destination Indication

This feature allows the LCD on the calling station/Attendant Console to indicate the connected destination number (answering station number) and the sub-address sent from the opposite office.

### Figure 1-9 Connected Destination Indication



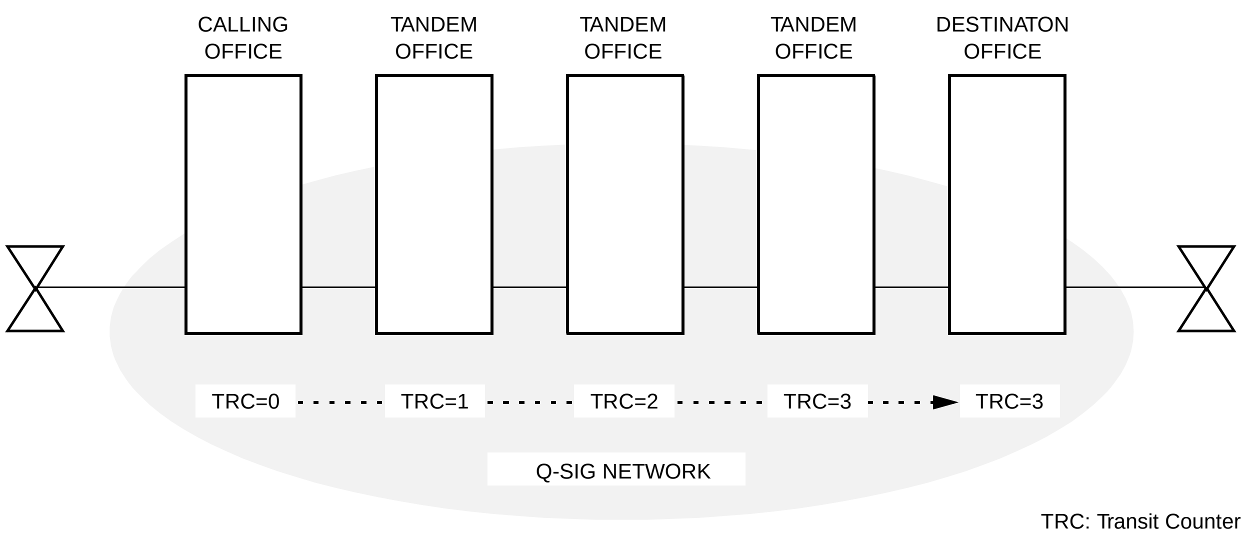

- The LCD does not indicate the answering station number and sub-address number if the numbers are not sent from the opposite office.
- If the calling station is an ISDN terminal or a terminal which has no indicator, the answering station number and sub-address number cannot be indicated.
- If the answering station number exceeds 16 digits, the first 15 digits and "*" are indicated on the D$^{term}$ LCD. "*" means existence of more than 15 digits.

- If the sub-address exceeds 8 digits, the first 8 digits and “*” are indicated on the D$^{term}$ LCD. “*” means existence of more than 8 digits.
- The sub-address of the answering station is not indicated on the Attendant Console LCD.
- If the answering station number exceeds 6 digits, the last 6 digits are indicated on the Attendant Console LCD.
- It can be specified to each station (Single line Telephone/D$^{term}$) whether an answering station number is sent or not when answering a Q-SIG call, by system data programming. Attendant Console number cannot be sent.

## Transit Counter Relaying

Transit counter is used as the information which informs the number of stages on tandem connection. On the Q-SIG network, the transit Counter 0 is sent from the calling office. The tandem office sends the transit counter to the destination office adding 1 to the value of received transit counter. In this manner, the transit counter value increases according to the number of the stages of tandem connection.

**Figure 1-10 Transit Counter**




- This feature is available when the all PBXs in the network are connected to each other by Q-SIG interface.
- The transit counter values 0 through 31 are available.
- If the tandem office does not receive the transit counter from the opposite office, the tandem office sends the transit counter as “0” to next office.

# CHAPTER 2

# INSTALLATION

This chapter explains the hardware installation procedure to provide Q-SIG interface on the PBX.

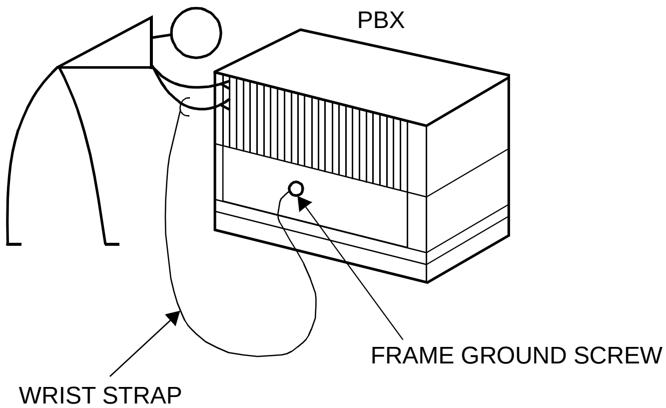
# PRECAUTIONS

## STATIC ELECTRICITY GUARD

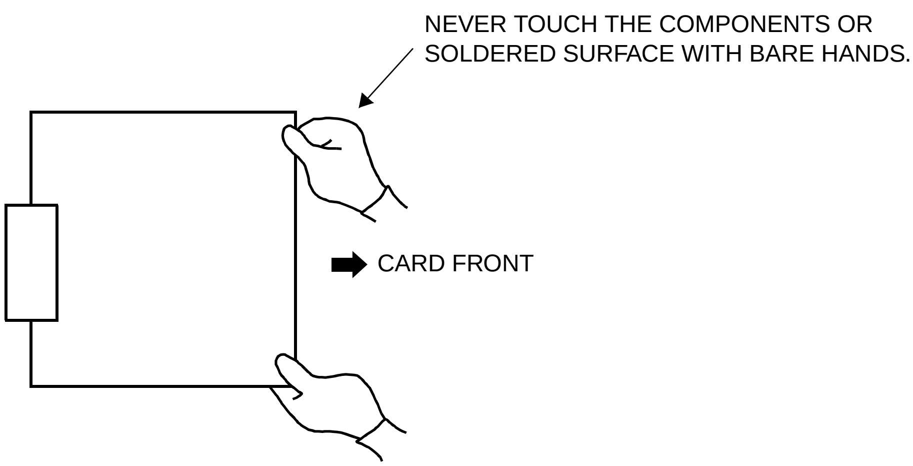
You must wear a grounded wrist strap to protect circuit cards from static electricity.

**Figure 2-1 Static Electricity Guard (1 of 2)**

- WHEN PLUGGING/UNPLUGGING A CIRCUIT CARD

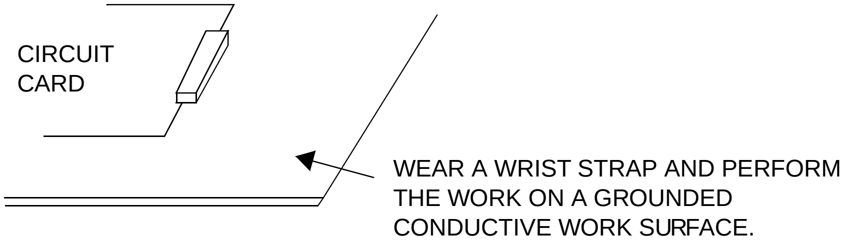



- WHEN HOLDING A CIRCUIT CARD

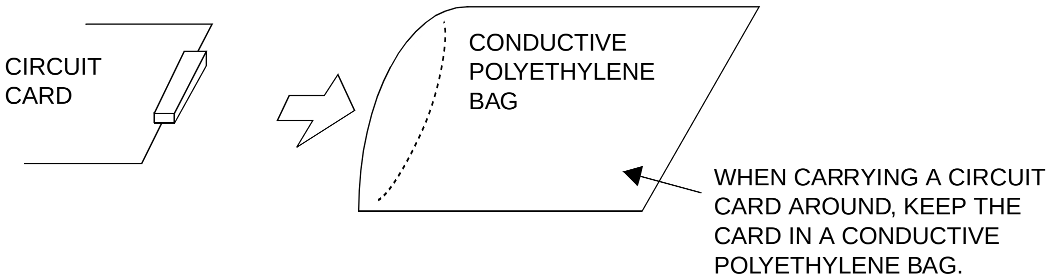


## Figure 2-1 Static Electricity Guard (2 of 2)

- WHEN MAKING A SWITCH SETTING ON A CIRCUIT CARD




- WHEN CARRYING A CIRCUIT CARD

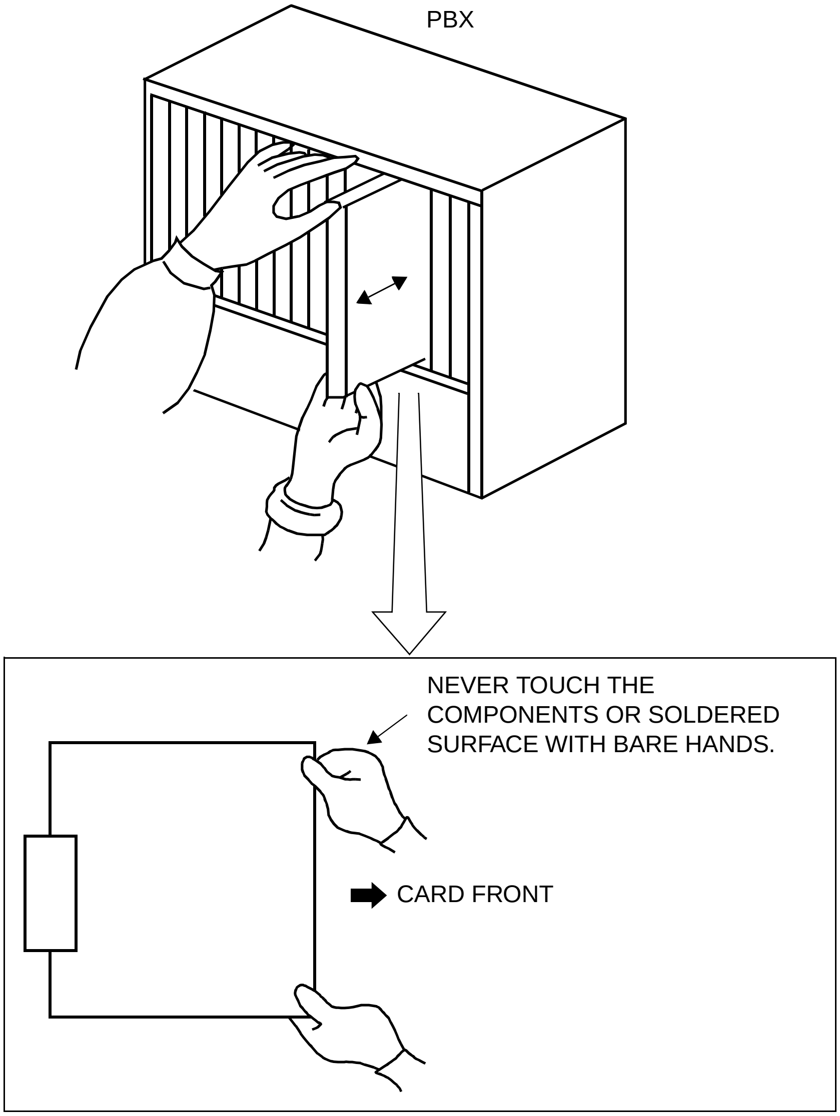



The mark shown below is attached to the sheet for the work in which circuit cards are handled. When engaging in such work, the installer must be careful not to cause damage by static electricity.



## Caution

You must hold the edge of a circuit card when plugging or unplugging the circuit card. If you touch another area, you may be exposed to hazardous voltages.



# REQUIRED EQUIPMENT

Table 2-1 shows the equipment required to provide Q-SIG interface to the system.

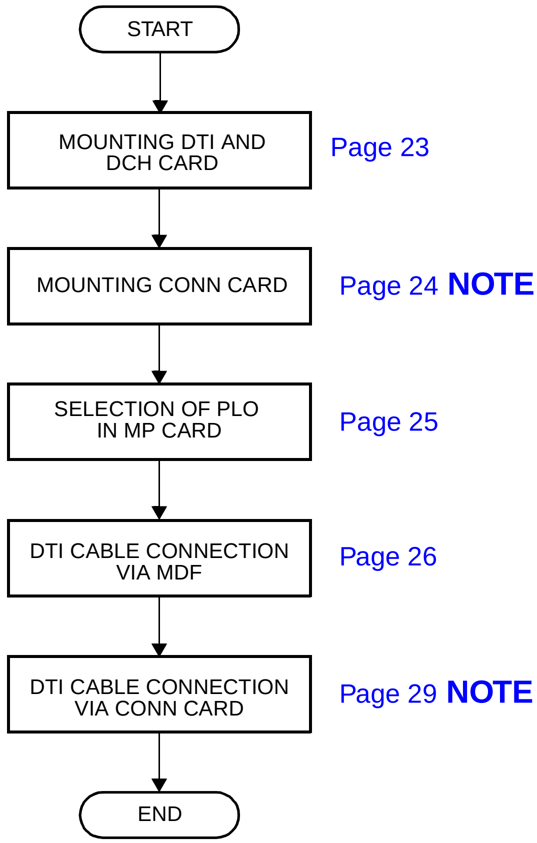
**Table 2-1 Required Equipment for Q-SIG**

| EQUIPMENT | DESCRIPTION | QUANTITY | REMARKS |
|---|---|---|---|
| PN-30DTC-A<br>(30-DTI)<br>(Australia/Japan) | 30-Channel DTI Card | 1-4 | |
| PN-24DTA-C<br>(24-DTI)<br>(U.S.) | 24-Channel DTI Card | 1-4 | |
| PN-SC01<br>(DCH) | D Channel Handler Card | 1-4 | |
| PZ-M542/M557(CONN) | Coaxial Cable Connection Card | 1-4 | 2 cards/PIM<br>1 DTI/card |

# INSTALLATION PROCEDURE

Install the equipment for Q-SIG according to the procedure in Figure 2-2.

**Figure 2-2 Installation Procedure for Q-SIG**




**NOTE:** This procedure is required when you provide CONN card to connect a coaxial cable for 24-DTI/30-DTI.

## Mounting DTI and DCH Card




(1) Before mounting the 24-DTI/30-DTI card and DCH card, set the MB switch to UP position, and set the other switches to appropriate position. See CHAPTER 4, Page 41.

(2) Mount the 24-DTI/30-DTI card and the DCH card in the following AP slots on PIM0-PIM7.
PIM0: AP00-AP10 slots
PIM1-7: AP00-AP11 slots

**NOTE:** The DTI card (DTI0, DTI1) which sends a clock signal to PLO of the MP card must be mounted in the AP slots on PIM0.

(3) After mounting the card, set the MB switch to DOWN position to put the card in service.

## Mounting CONN Card

When providing CONN (PZ-M542/M557) card to connect a coaxial cable for 24-DTI/30-DTI, do the following installation.

(1) Confirm the correct switch setting of the CONN card. See CHAPTER 4, Page 41.

(2) Mount the CONN card to LTC connector on BWB in the PIM which accommodates DTI cards.
For details, refer to the Installation Procedure Manual.

## Selection of PLO in MP Card

(1) Confirm the correct switch settings of MP card. See CHAPTER 4, Page 41.

(2) Mount the MP card on the MP slot of PIM0.

## DTI Cable Connection via MDF

When you use a twisted-pair cable, connect the cable to a CSU via the MDF as shown in Figure 2-3.


- Location of AP Slots and LTC Connectors for DTI - Page 27
- Example of MDF Cross Connection for DTI -Page 28


**Figure 2-3 Cable Connection via MDF**

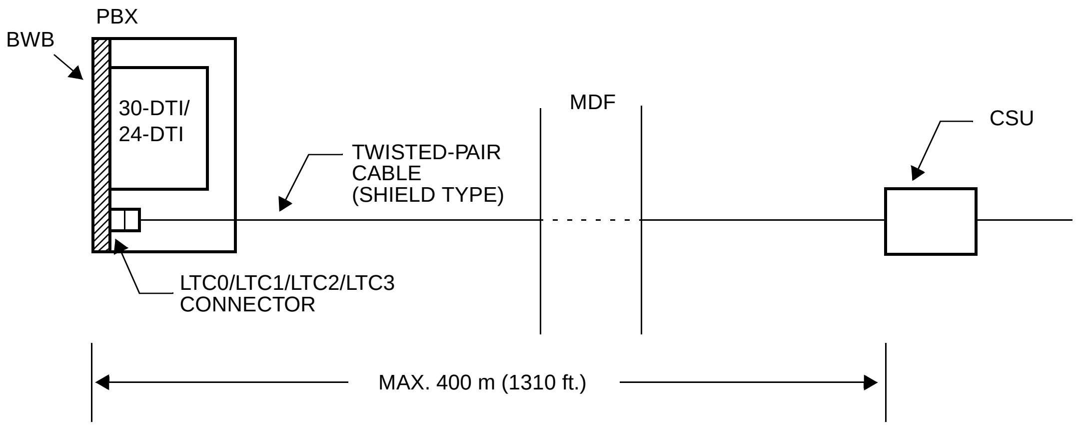
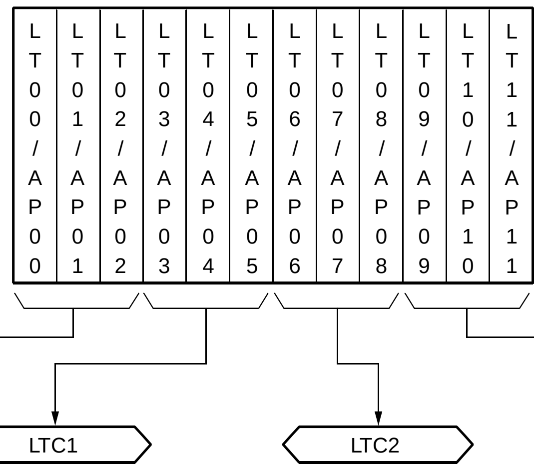


Figure 2-4 shows LTC connector corresponds with the AP slots, and DTI pin assignment for each AP slot.

## Figure 2-4 Location of the AP Slots and the LTC Connectors for DTI




**LTC0**

| Pin | Signal | Pin | Signal | Slot |
|---|---|---|---|---|
| 01 | RA | 26 | RB | AP00 SLOT (01–08) |
| 02 | TA | 27 | TB | |
| 03 | | 28 | | |
| 04 | | 29 | | |
| 05 | | 30 | | |
| 06 | | 31 | | |
| 07 | | 32 | | |
| 08 | | 33 | | |
| 09 | RA | 34 | RB | AP01 SLOT (09–16) |
| 10 | TA | 35 | TB | |
| 11 | | 36 | | |
| 12 | | 37 | | |
| 13 | | 38 | | |
| 14 | | 39 | | |
| 15 | | 40 | | |
| 16 | | 41 | | |
| 17 | RA | 42 | RB | AP02 SLOT (17–24) |
| 18 | TA | 43 | TB | |
| 19 | | 44 | | |
| 20 | | 45 | | |
| 21 | | 46 | | |
| 22 | | 47 | | |
| 23 | | 48 | | |
| 24 | | 49 | | |
| 25 | MJ | 50 | MN | |

**LTC1**

| Pin | Signal | Pin | Signal | Slot |
|---|---|---|---|---|
| 01 | RA | 26 | RB | AP03 SLOT (01–08) |
| 02 | TA | 27 | TB | |
| 03 | | 28 | | |
| 04 | | 29 | | |
| 05 | | 30 | | |
| 06 | | 31 | | |
| 07 | | 32 | | |
| 08 | | 33 | | |
| 09 | RA | 34 | RB | AP04 SLOT (09–16) |
| 10 | TA | 35 | TB | |
| 11 | | 36 | | |
| 12 | | 37 | | |
| 13 | | 38 | | |
| 14 | | 39 | | |
| 15 | | 40 | | |
| 16 | | 41 | | |
| 17 | RA | 42 | RB | AP05 SLOT (17–24) |
| 18 | TA | 43 | TB | |
| 19 | | 44 | | |
| 20 | | 45 | | |
| 21 | | 46 | | |
| 22 | | 47 | | |
| 23 | | 48 | | |
| 24 | | 49 | | |
| 25 | | 50 | | |

**LTC2**

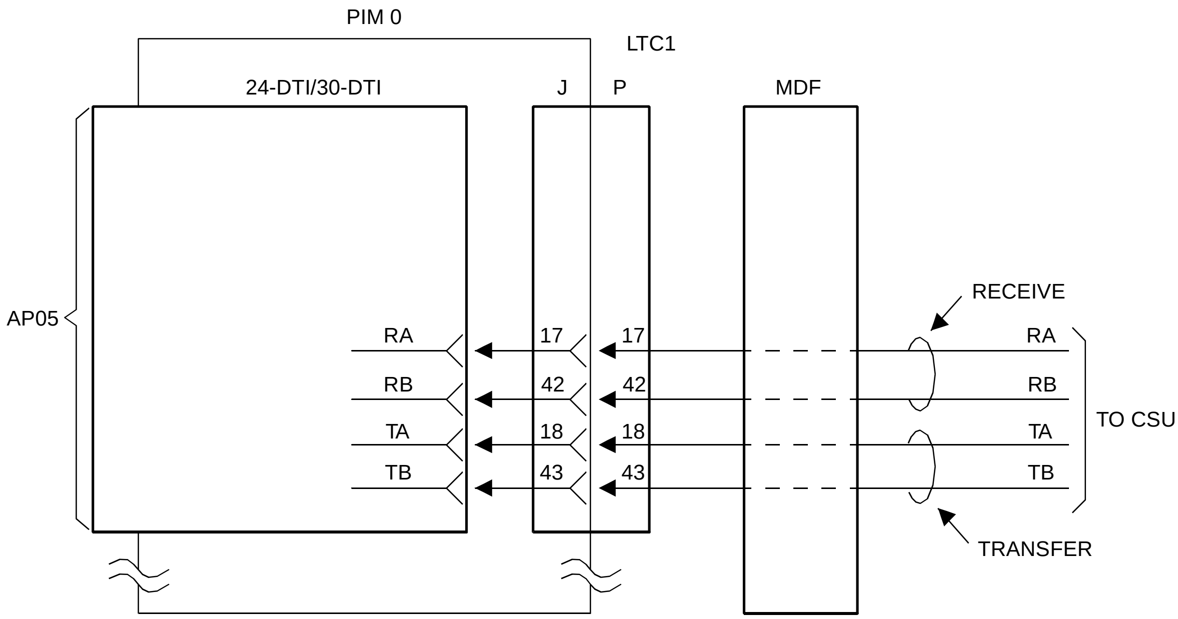
| Pin | Signal | Pin | Signal | Slot |
|---|---|---|---|---|
| 01 | RA | 26 | RB | AP06 SLOT (01–08) |
| 02 | TA | 27 | TB | |
| 03 | | 28 | | |
| 04 | | 29 | | |
| 05 | | 30 | | |
| 06 | | 31 | | |
| 07 | | 32 | | |
| 08 | | 33 | | |
| 09 | RA | 34 | RB | AP07 SLOT (09–16) |
| 10 | TA | 35 | TB | |
| 11 | | 36 | | |
| 12 | | 37 | | |
| 13 | | 38 | | |
| 14 | | 39 | | |
| 15 | | 40 | | |
| 16 | | 41 | | |
| 17 | RA | 42 | RB | AP08 SLOT (17–20) |
| 18 | TA | 43 | TB | |
| 19 | | 44 | | |
| 20 | | 45 | | |
| 21 | | 46 | | |
| 22 | | 47 | | |
| 23 | | 48 | | |
| 24 | | 49 | | |
| 25 | | 50 | | |

**LTC3**

| Pin | Signal | Pin | Signal | Slot |
|---|---|---|---|---|
| 01 | RA | 26 | RB | AP09 SLOT (01–04) |
| 02 | TA | 27 | TB | |
| 03 | | 28 | | |
| 04 | | 29 | | |
| 05 | | 30 | | |
| 06 | | 31 | | |
| 07 | | 32 | | |
| 08 | | 33 | | |
| 09 | RA | 34 | RB | AP10 SLOT (09–12) |
| 10 | TA | 35 | TB | |
| 11 | | 36 | | |
| 12 | | 37 | | |
| 13 | | 38 | | |
| 14 | | 39 | | |
| 15 | | 40 | | |
| 16 | | 41 | | |
| 17 | RA | 42 | RB | AP11 SLOT (17–20) |
| 18 | TA | 43 | TB | |
| 19 | | 44 | | |
| 20 | | 45 | | |
| 21 | | 46 | | |
| 22 | | 47 | | |
| 23 | | 48 | | |
| 24 | | 49 | | |
| 25 | | 50 | | |

Figure 2-5 shows an example of the cable connection when the 24-DTI/30-DTI card is mounted in the AP05 slot of PIM0.

## Figure 2-5 Example of MDF Cross Connection for DTI




LTC1 (J)

| | | | |
|---|---|---|---|
| 17 | RA | 42 | RB |
| 18 | TA | 43 | TB |
| 19 | | 44 | |
| 20 | | 45 | |

LTC1 (P)

| | | | |
|---|---|---|---|
| 42 | RB | 17 | RA |
| 43 | TB | 18 | TA |
| 44 | | 19 | |
| 45 | | 20 | |

## DTI Cable Connection via CONN Card

When you use an coaxial cable, connect the cable to a CSU via the CONN (PZ-M542/M557) card as shown in Figure 2-6.

### Figure 2-6 Cable Connection via the CONN Card

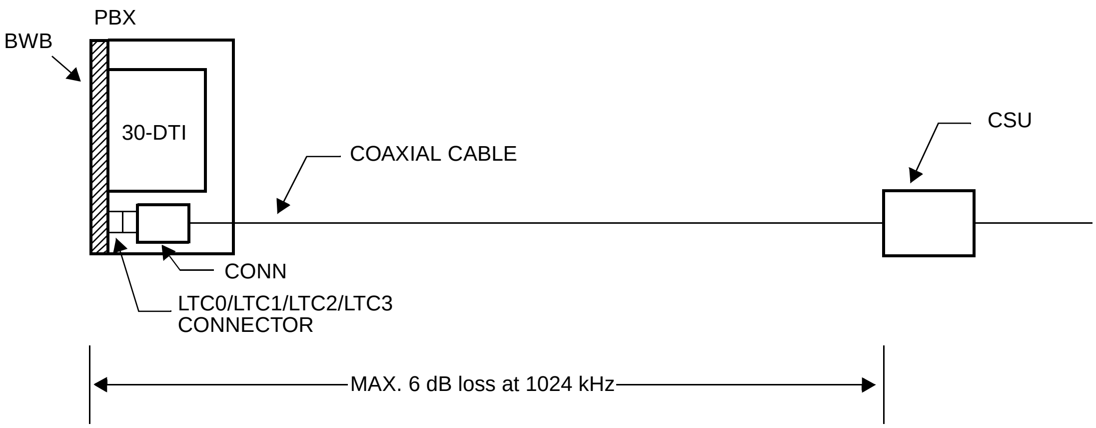
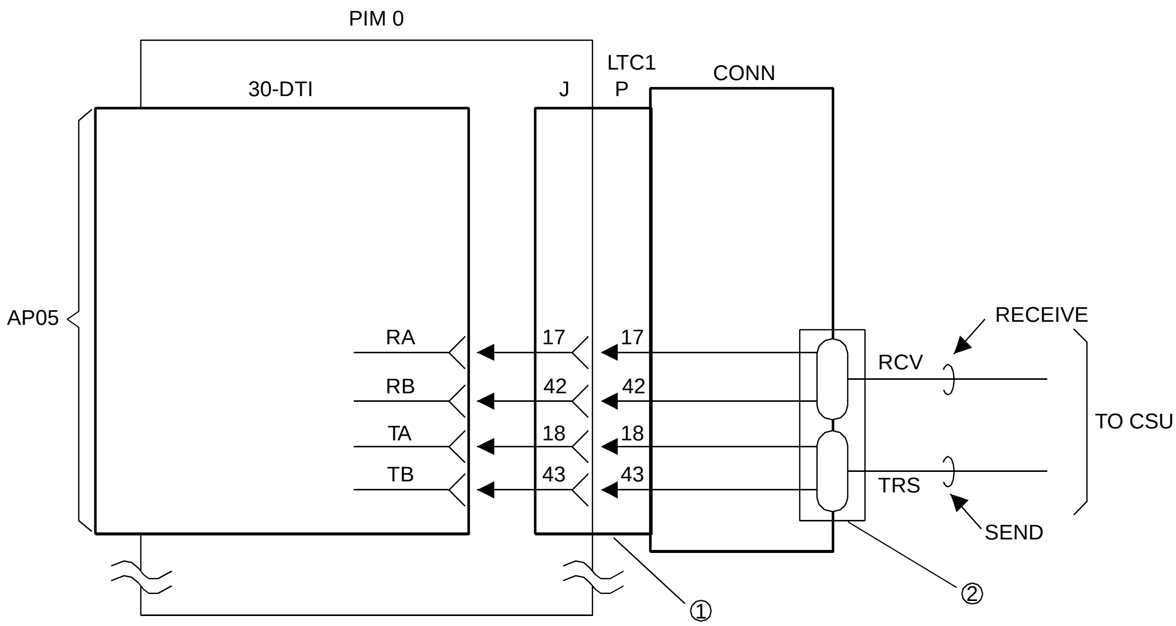
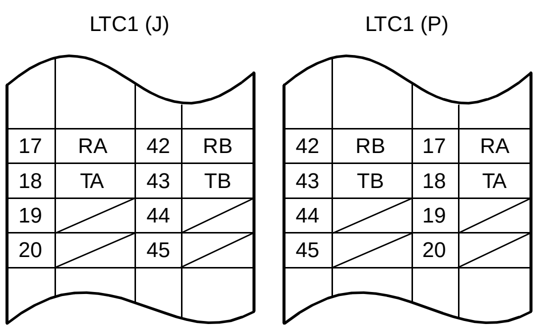


Figure 2-7 shows an example of the cable connection when the 24-DTI/30-DTI card is mounted in the AP05 slot of PIM0.

## Figure 2-7 Example of Coaxial Cable Connection




① LTC1 CONNECTOR




② COAXIAL CONNECTOR

# CHAPTER 3

# SYSTEM DATA PROGRAMMING

This chapter explains the programming procedure to provide Q-SIG feature on the PBX.

# HOW TO READ THIS CHAPTER

In the programming procedure, the meaning of (1), (2) and markings are as follows.

(1) : 1st Data

(2) : 2nd Data

◀ : Initial Data
With the system data clear command (CM00, CM01), the data with this marking is automatically assigned for each command.

(INITIAL) : System Initialization
After entering the data, system reset is required (Depress SW1 on the MP card).

(DCH INITIAL) : DCH Initialization
A reset of the DCH card is required after data setting.
Set the Make Busy switch to UP and then Down.

# DTI ASSIGNMENT

| START | DESCRIPTION | DATA |
|---|---|---|
| CM05 | Assign an AP number to the DTI card. The AP number must match the SENS switch setting on the DTI card.<br>INITIAL | • Y=0<br>(1) 04-15, 20-31: AP No.<br>(2) 09: DTI card |
| CM07 | Assign a Q-SIG trunk number to each channel number on the DTI card.<br>INITIAL<br>The system allocates time slots to consecutive channels from lowest to highest channel number assigned. To minimize the number of time slots allocated, assign trunk numbers to the consecutive channels on each card. Never skip channels in CM07. | • YY=01<br>(1) XX ZZ<br>XX: 04-15, 20-31: AP No. assigned by CM05 Y=0<br>ZZ: 01-15, 17-31: Channel No. of DTI<br>**NOTE 1**<br>(2) D000-D255: Trunk No.<br>Trunk No. already assigned by CM10 cannot be used. |
| CM20 | Assign the access code for Q-SIG to LCR Group 0-3. | • Y=0-3 Numbering Plan Group 0-3<br>(1) X-XXXX: Access code<br>(2) A126-A129: LCR Group 0-3 |
| A | | |

| | DESCRIPTION | DATA |
|---|---|---|
| A | | |
| CM30 | Assign a trunk route to each Q-SIG trunk used for voice channel (B Channel), and also to signaling channel (D Channel).<br><br>**NOTE 1:** DTI route must be separated from analog trunk routes.<br><br>**NOTE 2:** The trunk routes for D Channel must be different from the trunk routes for B Channel. | • YY=00<br>(1) 000-255: Trunk No. assigned by CM07 YY=01<br>(2) 00-63: Trunk Route No. |
| | Assign the trunk route data to each Q-SIG incoming trunk used for voice channel only. | • YY=02 Day Mode<br>• YY=03 Night Mode<br>• YY=40 Mode A<br>• YY=41 Mode B<br>(1) 000-255: Trunk No. assigned by CM07 YY=01<br>(2) 04: Direct-In Termination<br>21: Dial-in Termination |
| | Assign CIC (Circuit Identification Code) number to each Q-SIG trunk used for voice channel only.<br><br>**NOTE:** CIC number must not be assigned to the trunk number of D Channel: TS 16 (30DTI). | • YY=07<br>(1) 000-255: Trunk No. assigned by CM07 YY=01<br>(2) 000-029: CIC No.<br><br>EXAMPLE OF 30DTI<br>B Channel trunk No.: D100-D114, D116-D130<br>D Channel trunk No.: D115<br>(1) 100-114, 116-130<br>(2) 000-014, 015-029<br>EXAMPLE OF 24DTI<br>B Channel trunk No.: D100-D122<br>D Channel trunk No.: D123<br>(1) 100-122<br>(2) 123 |
| B | | |

B

| DESCRIPTION | DATA |
|---|---|

**CM35**

Assign the trunk route data to the DTI route number assigned by CM30 Y=00.

**NOTE:** CM35 YY=00, 04, 05, 09, 15 and 19 should be assigned to only the B Channel trunk routes.
For D Channel trunk route, no data setting is required.

- YY=00 Kind of Trunk Route
  (1) 00-63: B Channel Trunk Route No.
  (2) 04: Tie Line trunk

- YY=04
  Answer Signal from distant office
  (1) 00-63: B Channel Trunk Route No.
  (2) 2: Answer signal arrives

- YY=05
  Release Signal from distant office
  (1) 00-63: B Channel Trunk Route No.
  (2) 1◀ : Release signal arrives

- YY=09 Incoming Connection Signaling
  (1) 00-63: B Channel Trunk Route No.
  (2) 08: ISDN/Q-SIG

- YY=15 Kind of Call Termination Indicator Key/Lamp on ATT
  (1) 00-63: B Channel Trunk Route No.
  (2) 00-07: C.O. Incoming 0-7

YY=19 DTI PAD
[For Australia]

| CONNECTION PATTERNS | PAD DATA OF DTI [dB] | | | |
|---|---|---|---|---|
| | DATA =4 (T/R) | DATA =5 (T/R) | DATA =6 (T/R) | DATA =7 (T/R) |
| Station-DTI | | | | 0/0 |
| Tone-DTI | | | | 0/0 |
| COT/DID/LDT-DTI | | | | 0/0 |
| ODT-DTI | | | | 0/0 |
| DTI-DTI | | | | 0/0 |

T/R : Transmitter PAD/Receiver PAD
\+ : Gain
– : Loss

- YY=19
  (1) 00-63: B Channel Trunk Route No.
  (2) 0-3: Programmable PAD
  (See CM42)
  4-7◀ : Fixed PAD

C

C

| | DESCRIPTION | DATA |
|---|---|---|

**CM35**

YY=19 DTI PAD
[For North America/Other Countries]

| CONNECTION PATTERNS | PAD DATA OF DTI [dB] | | | |
|---|---|---|---|---|
| | DAT A=4 (T/R) | DAT A=5 (T/R) | DAT A=6 (T/R) | DAT A=7 (T/R) |
| Station-DTI | –3/–8 | –3/–3 | –3/–3 | –3/–8 |
| Tone-DTI | 0/0 | 0/0 | 0/0 | 0/0 |
| COT/DID/LDT/ODT (2W E&M)-DTI | 0/0 | 0/0 | 0/0 | 0/0 |
| ODT (4W E&M)-DTI | +3/–3 | 0/0 | 0/0 | +3/–3 |
| DTI-DTI | 0/–6 | 0/0 | 0/–6 | 0/0 |

T/R : Transmit PAD/Receive PAD
\+ : Gain
– : Loss

Assign Q-SIG to the B Channel trunk routes and the D Channel trunk route.

- YY=90
  Assignment of DTI route for Q-SIG
  (1) 00-63: B Channel /D Channel Trunk Route No.
  (2) 5: Q-SIG (ETS300 172)

Assign the LAPD mode of the D Channel trunk route.
This data setting must not be identical with the opposite PBX.
If the opposite PBX is defined as a “Network Mode”, set this data to 1 (User Mode).

- YYY=113
  (1) 00-63: D Channel Trunk Route No.
  (2) 0 : Network Mode
  1◀ : User Mode

DCH INITIAL

END

# DCH ASSIGNMENT

START

| | DESCRIPTION | DATA |
|---|---|---|
| CM05 | Assign an AP number to the DCH card. The AP number must match the SENS switch setting on the DCH card. INITIAL | • Y=0<br>(1) 04-15, 20-31: AP No.<br>(2) 32: DCH card for Q-SIG |
| CM06 | Assign the DCH number to the AP number of DCH assigned by CM05. INITIAL | • YY=08<br>(1) 0-7: DCH No.<br>(2) 04-15, 20-31: AP No. assigned by CM05 Y=0 |
| CM35 | Assign the DCH number to the Q-SIG trunk route assigned by CM30 YY=00.<br>**NOTE:** This data should be assigned to only the B Channel trunk routes. | • YY=93 Assignment of DCH<br>(1) 00-63: B Channel Trunk Route No.<br>(2) 00-07: DCH No. assigned by CM06 |
| CMA9 | Assign the trunk number assigned by CM07 YY=01 to each DCH number for providing D Channel path between DTI and DCH. | • YY=00<br>(1) 0-7: DCH No. assigned by CM06<br>(2) 000-255: Trunk No. assigned by CM07 YY=01 |

END

# TANDEM CONNECTION ASSIGNMENT

To provide Tandem Connection (Tie Line to Q-SIG, Q-SIG to Tie Line), do the following programming.

START

| | DESCRIPTION | DATA |
|---|---|---|
| CM08 | Specify whether the busy tone is sent to a calling party of Q-SIG when a called party is busy in the tandem connection (Q-SIG to COT). | (1) 407<br>(2) 0 : Available (BT)<br>1◀ : Not available (RBT) |
| CM36 | Specify the combination of trunk routes allowing the tandem connection. | (1) XX YY<br>XX : 00-63 (Incoming Trunk Route)<br>YY : 00-63 (Outgoing Trunk Route)<br>(2) 0 : Allow<br>1◀ : Restricted |
| CM41 | Specify the timing start when making a Q-SIG call from a station (PB/DP telephone, D$^{term}$) or Attendant Console for the tandem connection.<br>**NOTE 1:** By using this command, a Q-SIG call is available even if “#” is not dialed.<br>**NOTE 2:** This command is effective for dialing a called number. When dialing a called party subaddress, this command is not effective. | • Y=0<br>(1) 57<br>(2) 03-14: 3-14 sec. (1 sec. increments)<br>If no data is set, the timing start is not effective. |

END

# CONNECTED DESTINATION INDICATION ASSIGNMENT

To send own office number with the answering station (single line telephone, D$^{term}$) number to the calling party, do the following programming.

| START | DESCRIPTION | DATA |
|---|---|---|
| CMA9 | Assign the own office number sent with the answering station number, if required. DCH INITIAL | • YY=01<br>(1) 0-7: DCH No.<br>(2) 0-999: Own Office No. |
| END | | |

# CHAPTER 4

# CIRCUIT CARD INFORMATION

This chapter explains the mounting location, the meaning of lamp indications, and the method of switch settings of each circuit card for the Q-SIG.

# HOW TO READ THIS CHAPTER

This chapter explains each circuit card used in this system about the following items. Explanations are given in alphabetical order of the circuit card names within each circuit card category (Control, Application Processor, and Line/Trunk).

(1) Locations of Lamps, Switches, and Connectors
The locations of lamps, switches, and connectors of each circuit card are shown by a face layout.

(2) Lamp Indications
The name, color, and functions of each indicator lamp equipped on each circuit card are described in a table.

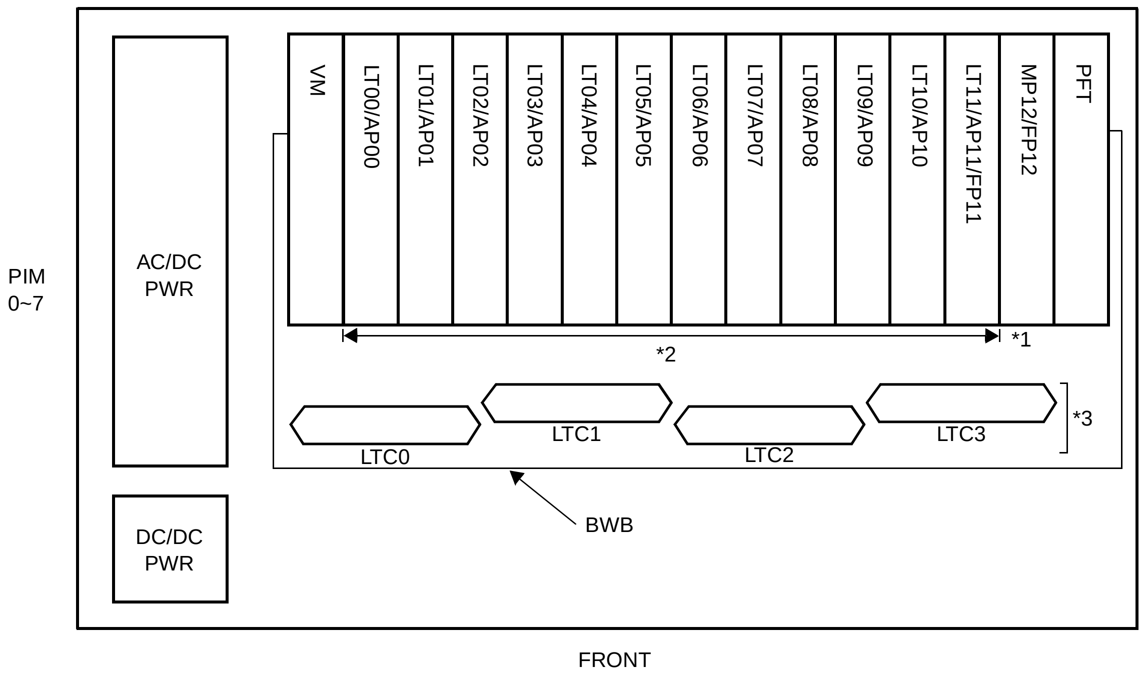
(3) Switch Settings
The name, settings, and functions of each switch equipped on each circuit card are described in a table.

Each switch setting table has a “CHECK” column. Make necessary entries in the CHECK column during and/or after the system installation and maintenance, and use each table as a reference for subsequent system maintenance and operations.

# MOUNTING LOCATION OF CIRCUIT CARD

This section explains the conditions for mounting circuit cards for the Q-SIG.
Figure 4-1 shows circuit card mounting slots allocated in the PIM.

**Figure 4-1 Mounting Location of Circuit Card**




*1: PN-CP14 (MP) card on the MP12 slot on PIM0.
*2: The following application processor card mounted on the AP00-AP11 slots on PIM0-7.
PN-24DTA-C (DTI)
PN-30DTC-A (DTI)
PN-SC01 (DCH)
*3: PZ-M542/PZ-M557 (CONN) card on the LTC0-LTC3 connectors on the PIM which accommodates 24DTI/30DTI card.

# LIST OF REQUIRED CIRCUIT CARD

Table 4-1 shows the required circuit cards to be explained in this section.

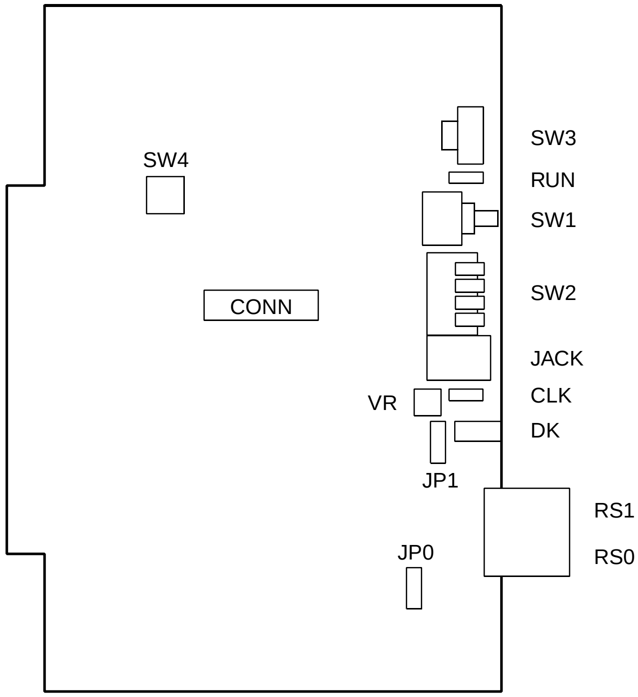
**Table 4-1 List of Required Circuit Card**

| NAME (FUNCTIONAL NAME) | LAMP X: PROVIDED –: NOT PROVIDED | SWITCH X: PROVIDED –: NOT PROVIDED | EXTRACTION/ INSERTION WITH POWER ON X: ALLOWED ∆: ALLOWED AFTER MB* –: NOT ALLOWED | REFERENCE PAGE |
|---|---|---|---|---|
| PN-CP14 (MP) | X | X | – | Page 45 |
| PN-30DTC-A (DTI) | X | X | ∆ | Page 50 |
| PN-24DTA-C (DTI) | X | X | ∆ | Page 56 |
| PN-SC01 (DCH) | X | X | ∆ | Page 62 |
| PZ-M542 (CONN) | – | X | X | Page 65 |
| PZ-M557 (CONN) | – | X | X | Page 67 |

*MB = Make Busy

## PN-CP14 (MP)

Locations of Lamps, Switches, and Connectors



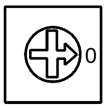

CONN: To CONNR connector on PZ-M537 (EXPMEM)

Lamp Indications

| LAMP NAME | COLOR | FUNCTION |
|---|---|---|
| RUN | Green | Flashes at 120 IPM while this card is operating normally. |
| CLK | Green | Remains lit while receiving clock signals to the PLO. |

## Switch Settings

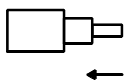
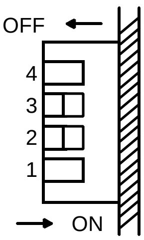
> **Caution**
>
> When the operating power is being supplied to this circuit card, <u>do not plug/unplug this circuit card into/from its mounting slot</u>.

| SWITCH NAME | SWITCH NUMBER | SETTING POSITION | FUNCTION | CHECK |
|---|---|---|---|---|
| SW3 (Rotary SW)<br><br><br>**NOTE 1** | 0-F | 0 | On Line<br>(Call processing is in progress) | |
| | | 2 | Off Line (Call processing is stopped)<br>• I/O port: As per CM40 YY=08 | |
| | | 3 | Off Line (Call processing is stopped)<br>• I/O port: 9600 bps (Fixed) | |
| | | 5<br>**NOTE 2** | Off Line (Call processing is stopped)<br>• I/O port: 9600 bps | |
| | | 6<br>**NOTE 2** | Off Line (Call processing is stopped)<br>• I/O port: 19200 bps | |
| | | 7<br>**NOTE 2** | Off Line (Call processing is stopped)<br>• I/O port: 38400 bps | |
| | | 8<br>**NOTE 2** | Off Line (Call processing is stopped)<br>• I/O port: 57600 bps | |
| | | B | For clearing the office data | |
| | | C | For setting the resident system program | |
| | | 1, 4, 9<br>A, D-F | Not used | |

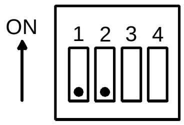
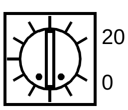
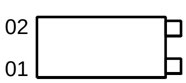
(Continued)

**NOTE 1:** Set the groove on the switch to the desired position.

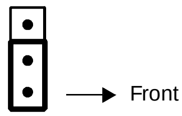
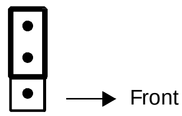
**NOTE 2:** Only when executing “MP Program Download” in MATWorX, set the SW3 to 5-8.

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NUMBER</th><th>SETTING POSITION</th><th>FUNCTION</th><th>CHECK</th></tr>
<tr><td>SW1 (Push SW)<br></td><td></td><td></td><td>For initializing CPU</td><td></td></tr>
<tr><td rowspan="5">SW2<br>(Piano Key SW)<br><br></td><td rowspan="2">1</td><td>ON</td><td>A-law (Australia)</td><td></td></tr>
<tr><td>OFF</td><td>μ-law (North America)</td><td></td></tr>
<tr><td>2, 3</td><td colspan="2">Selection of PLO0 input<br>(Phase Locked Oscillator)<br>• For clock receiver office:<br>
<table>
<tr><th>SW2-2</th><th>SW2-3</th><th>FUNCTION</th></tr>
<tr><td>OFF</td><td>OFF</td><td>1.5 MHz clock<br>[For PN-24DTA-C/PN-24PRTA]</td></tr>
<tr><td>ON</td><td>OFF</td><td>192 kHz clock<br>[For PN-BRTA]</td></tr>
<tr><td>OFF</td><td>ON</td><td>2 MHz clock<br>[For PN-30DTC-A/PN-2BRTC]</td></tr>
<tr><td>ON</td><td>ON</td><td>Not used</td></tr>
</table>
• For clock source office:<br>SW2-2 SW2-3<br>OFF OFF</td><td></td></tr>
<tr><td rowspan="2">4</td><td>ON</td><td>When using RS1 port for built-in MODEM</td><td></td></tr>
<tr><td>OFF</td><td>When using RS1 port for RS-232C</td><td></td></tr>
</table>

(Continued)

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NUMBER</th><th>SETTING POSITION</th><th>FUNCTION</th><th>CHECK</th></tr>
<tr><td rowspan="3">SW4 (Dip SW)<br></td><td>1</td><td>OFF</td><td>Not used</td><td></td></tr>
<tr><td>2</td><td>OFF</td><td>Not used</td><td></td></tr>
<tr><td>3, 4</td><td colspan="2">Selection of PLO1 input<br>(Phase Locked Oscillator)<br>• For clock receiver office:<br>
<table>
<tr><th>SW4-3</th><th>SW4-4</th><th>FUNCTION</th></tr>
<tr><td>OFF</td><td>OFF</td><td>1.5 MHz clock<br>[For PN-24DTA-C/PN-24PRTA]</td></tr>
<tr><td>ON</td><td>OFF</td><td>192 kHz clock<br>[For PN-BRTA]</td></tr>
<tr><td>OFF</td><td>ON</td><td>2 MHz clock<br>[For PN-30DTC-A/PN-2BRTC]</td></tr>
<tr><td>ON</td><td>ON</td><td>Not used</td></tr>
</table>
• For clock source office:<br>SW4-3 SW4-4<br>OFF OFF</td><td></td></tr>
<tr><td>VR (Rotary SW)<br></td><td></td><td></td><td>Variable Resister for External Hold Tone Source<br>(0 - 20 Kohms : Clockwise)</td><td></td></tr>
<tr><td rowspan="2">DK (Connector)<br></td><td>02</td><td colspan="2">Ground detection</td><td></td></tr>
<tr><td>01</td><td colspan="2">Ground sending</td><td></td></tr>
</table>

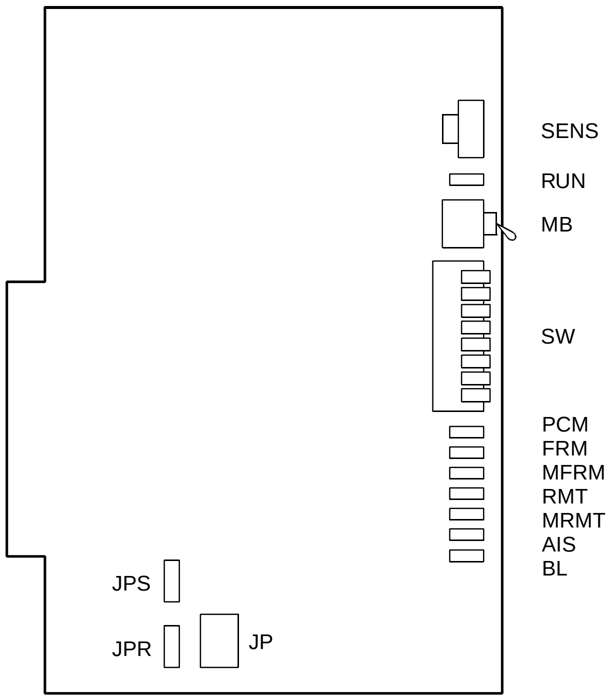
(Continued)

| SWITCH NAME | SWITCH NUMBER | SETTING POSITION | FUNCTION | CHECK |
|---|---|---|---|---|
| JP0 (Jumper pin)   | | UP | Not used<br>(Memory backup OFF) | |
| | | DOWN | For normal operation<br>(Memory backup ON) | |
| JP1 (Jumper pin)   | | UP | For using internal tone source | |
| | | DOWN | For using external tone source | |

The figure in the SWITCH NAME column and the position in ( ) in the SETTING POSITION column indicate the standard setting of the switch. When the switch is not set as shown by the figure and ( ), the setting of the switch varies with the system concerned.

# PN-30DTC-A (DTI)

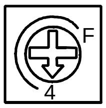
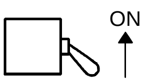
## Locations of Lamps, Switches and Connectors



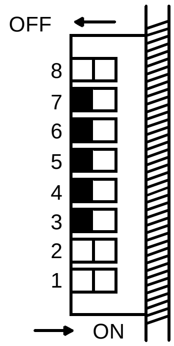
Lamp Indications

| LAMP NAME | COLOR | FUNCTION |
|---|---|---|
| RUN | Green | Flashes at 120 IPM when this card is normally operating. |
| PCM | Red | Remains lit when detecting PCM signal loss. |
| FRM | Red | Remains lit when detecting Frame Alignment signal loss. |
| MFRM | Red | Remains lit when detecting Multi-Frame Alignment signal loss on time Slot 16. |
| RMT | Red | Remains lit when receiving the alarm from a distant office because Frame Alignment signal loss has been detected at the distant office. |
| MRMT | Red | Remains lit when receiving the alarm from a distant office because Multi-Frame Alignment signal loss has been detected at the distant office. |
| AIS | Red | Remains lit when indicating that the pattern of consecutive “1” is being received. The distant office transmits this signal for a loop-back test distant. |
| BL | Red | B Channel status<br>ON : More than10 channels are busy<br>OFF : All channels are idle<br>Flash (60 IPM) : Only one channel is busy<br>Flash (120 IPM) : 2 to 10 channels are busy |

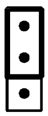
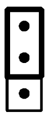
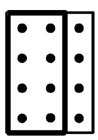
## Switch Settings

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NUMBER</th><th>SETTING POSITION</th><th>FUNCTION</th><th>CHECK</th></tr>
<tr><td rowspan="2">SENS<br>(Rotary SW)<br><br><br>NOTE 1</td><td>4-F</td><td colspan="2">Set the switch to match the AP Number (04-31) to be set by CM05.<br><table>
<tr><td rowspan="2">AP No.</td><td>SW-8: ON</td><td>04</td><td>05</td><td>06</td><td>07</td><td>08</td><td>09</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr>
<tr><td>SW-8: OFF</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td></tr>
<tr><td colspan="2">SW No.</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td></tr>
</table></td><td></td></tr>
<tr><td>0-3</td><td colspan="2">Not used</td><td></td></tr>
<tr><td rowspan="2">MB (Toggle SW)<br><br><br>NOTE 2</td><td rowspan="2"></td><td>UP</td><td>For make-busy</td><td></td></tr>
<tr><td>DOWN</td><td>For normal operation</td><td></td></tr>
</table>

(Continued)

| SWITCH NAME | SWITCH NUMBER | SETTING POSITION | FUNCTION | CHECK |
|---|---|---|---|---|
| SW (Piano Key SW)   | 1 **NOTE 3** **NOTE 4** | ON | Source clock signal from network is sent to the PLO 0 input on MP card. | |
| | | OFF | Source clock signal from network is not sent to the PLO 0 input on MP card | |
| | 2 **NOTE 3** **NOTE 4** | ON | Source clock signal from network is sent to the PLO 1 input on MP card. | |
| | | OFF | Source clock signal from network is not sent to the PLO 1 input on MP card. | |
| | 3 | ON | Remote loop-back | |
| | | OFF | For normal operation | |
| | 4 | ON | Local loop-back (AIS send) | |
| | | OFF | For normal operation | |
| | 5 | ON | Transmission line cable: Coaxial cable (75 ohms) | |
| | | OFF | Transmission line cable: Twisted-pair cable (120 ohms) | |
| | 6 | OFF | Always set to OFF | |
| | 7 | OFF | | |
| | 8 | ON | AP No. 04-15 | |
| | | OFF | AP No. 20-31 | |

(Continued)

| SWITCH NAME | SWITCH NUMBER | SETTING POSITION | FUNCTION | CHECK |
|---|---|---|---|---|
| JPS (Jumper pin)  | | UP | Balanced transmission (For twisted-pair cable) | |
| | | DOWN | TA is grounded on the transmission line (For coaxial cable) | |
| JPR (Jumper pin)  | | UP | Balanced transmission (For twisted-pair cable) | |
| | | DOWN | RA is grounded on the transmission line (For coaxial cable) | |
| JP (Jumper pin)  | | RIGHT | Line impedance: 75 ohms (For coaxial cable) | |
| | | LEFT | Line impedance: 120 ohms (For twisted-pair cable) | |

(Continued)

The figure in the SWITCH NAME column and the position in ( ) in the SETTING POSITION column indicate the standard setting of the switch. When the switch is not set as shown by the figure and ( ), the setting of the switch varies with the system concerned.

**NOTE 1:** Set the groove on the switch to the desired position.

**NOTE 2:** When the power is on, flip the MB switch to ON (UP position) before plugging/ unplugging the circuit card.

**NOTE 3:** Set the SW-1 and SW-2 as follows:

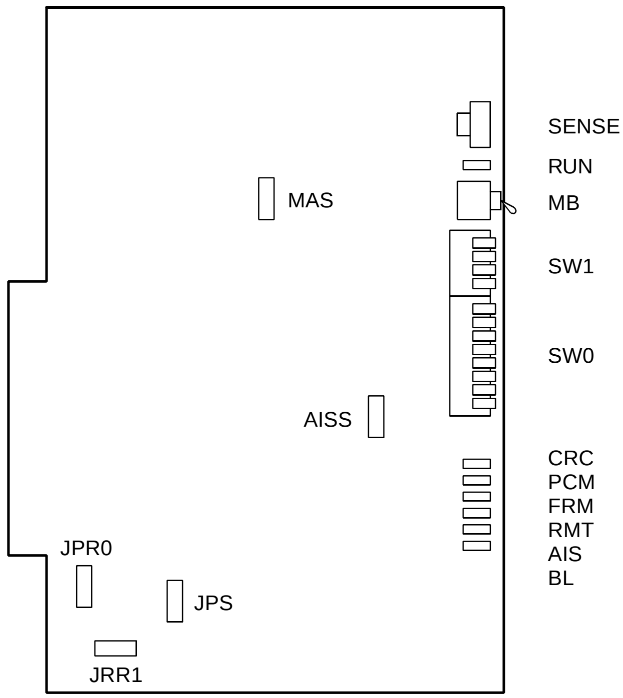
| CONDITIONS | DTI0 | | DTI1 | | DTI2 | | DTI3 | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| | SW -1 | SW -2 | SW -1 | SW -2 | SW -1 | SW -2 | SW -1 | SW -2 | |
| When one DTI is provided. | ON | OFF | – | – | – | – | – | – | MP card will receive the clock signal from DTI0 at its PLO0 input. |
| When more than one DTI is provided. | ON | OFF | OFF | ON | OFF | OFF | OFF | OFF | MP card will receive the clock signal from DTI0 at its PLO0 input, under normal conditions. Should a clock failure occur with DTI0, MP card will automatically switch to the PLO1 input which gets from DTI1. |

**NOTE 4:** When the PBX is a clock source office, set the SW-1 and SW-2 on all the DTI cards mounted in PIM0 to “OFF”.

**NOTE 5:** Mount the DTI card which receives a source clock signal into PIM0.

# PN-24DTA-C (DTI)

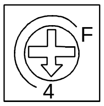
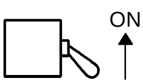
## Locations of Lamps, Switches, and Connectors



Lamp Indications

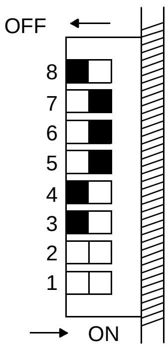
| LAMP NAME | COLOR | FUNCTION |
|---|---|---|
| RUN | Green | Flashes at 120 IPM while this card is operating normally. |
| CRC | Red | Remains lit when detecting Cyclic Redundancy Checking (CRC) errors. |
| PCM | Red | Remains lit when detecting PCM signal loss. |
| FRM | Red | Remains lit when detecting Frame Alignment signal loss. |
| RMT | Red | Remains lit when receiving Frame Alignment signal loss alarm from a distant office. |
| AIS | Red | Remains lit when a pattern of consecutive “1” is received. The distant office transmits this signal for a loop-back test. |
| BL | Red | B Channel status<br>ON : More than 10 channels are busy<br>OFF : All channels are idle<br>Flash (60 IPM) : Only one channel is busy<br>Flash (120 IPM) : 2 through 10 channels are busy |

## Switch Settings

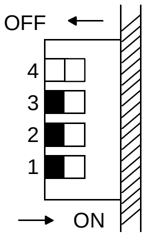
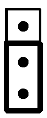
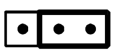
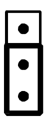
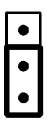
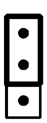
| SWITCH NAME | SWITCH NUMBER | SETTING POSITION | FUNCTION | CHECK |
|---|---|---|---|---|
| SENSE (Rotary SW)   **NOTE 1** | 0-3 | Not used | | |
| | 4-F | Set the switch to match the AP Number (04-31) to be set by CM05. | | |
| MB (Toggle SW)   **NOTE 2** | | UP | For make-busy | |
| | | DOWN | For normal operation | |

| AP No. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AP No.** | **SW1-4: ON** | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 |
| | **SW1-4: OFF** | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| **SW No.** | | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |

(Continued)

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NUMBER</th><th>SETTING POSITION</th><th>FUNCTION</th><th>CHECK</th></tr>
<tr><td rowspan="14">SW0<br>(Piano Key SW)<br><br></td><td rowspan="2">1<br>NOTE 3<br>NOTE 4</td><td>ON</td><td>Source clock signal from network is sent to the PLO 0 input on MP card.</td><td></td></tr>
<tr><td>OFF</td><td>Source clock signal from network is not sent to the PLO 0 input on MP card.</td><td></td></tr>
<tr><td rowspan="2">2<br>NOTE 3<br>NOTE 4</td><td>ON</td><td>Source clock signal from network is sent to the PLO 1 input on MP card.</td><td></td></tr>
<tr><td>OFF</td><td>Source clock signal from network is not sent to the PLO 1 input on MP card.</td><td></td></tr>
<tr><td rowspan="2">3</td><td>ON</td><td>Remote loop-back</td><td></td></tr>
<tr><td>OFF</td><td>For normal operation</td><td></td></tr>
<tr><td rowspan="2">4</td><td>ON</td><td>Local loop-back (AIS send)</td><td></td></tr>
<tr><td>OFF</td><td>For normal operation</td><td></td></tr>
<tr><td rowspan="2">5</td><td>ON</td><td rowspan="6">Set equalizer according to the cable length between the PBX and the MDF.<br><table><tr><th>SW0-5</th><th>SW0-6</th><th>SW0-7</th><th>CABLE LENGTH</th></tr><tr><td>ON</td><td>ON</td><td>ON</td><td>0-40m (0-131.2 ft.)</td></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>40-80m (131.2-262.5 ft.)</td></tr><tr><td>ON</td><td>OFF</td><td>ON</td><td>80-120m (262.5-394 ft.)</td></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td>120-160m (394-525 ft.)</td></tr><tr><td>OFF</td><td>ON</td><td>ON</td><td>160-200m (525-656 ft.)</td></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>Signal is not sent</td></tr></table></td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">6</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td rowspan="2">7</td><td>ON</td><td></td></tr>
<tr><td>OFF</td><td></td></tr>
<tr><td></td><td>8</td><td>OFF</td><td>Not used</td><td></td></tr>
</table>

(Continued)

| SWITCH NAME | SWITCH NUMBER | SETTING POSITION | FUNCTION | CHECK |
|---|---|---|---|---|
| SW1 (Piano Key SW)   **NOTE 4** | 1 | OFF | Not used | |
| | 2 | OFF | Not used | |
| | 3 | OFF | Not used | |
| | 4 | ON | AP No. 04-15 | |
| | | OFF | AP No. 20-31 | |
| JPR0 (Jumper pin)  | | UP | Neutral grounding on the receiving line is provided. | |
| | | DOWN | Neutral grounding on the receiving line is not provided. | |
| JPR1 (Jumper pin)  | | Right | Line impedance: 100 ohms | |
| | | Left | Line impedance: 110 ohms | |
| JPS (Jumper pin)  | | UP | Neutral grounding on the transmitting line is provided. | |
| | | DOWN | Neutral grounding on the transmitting line is not provided. | |
| MAS (Jumper pin)  | | UP | Clock Source | |
| | | DOWN | Clock Receiver | |
| AISS (Jumper pin)  | | UP | AIS signal is sent out when make-busy or power on. | |
| | | DOWN | AIS signal is not sent out when make-busy or power on. | |

(Continued)

The figure in the SWITCH NAME column and the position in in the SETTING POSITION-column indicate the standard setting of the switch. When the switch is not set as shown by the figure and , the setting of the switch varies with the system concerned.

**NOTE 1:** Set the groove on the switch to the desired position.

**NOTE 2:** When the power is on, flip the MB switch to ON (UP position) before plugging/ unplugging the circuit card.

**NOTE 3:** Set SW0-1 and SW0-2 as follows:

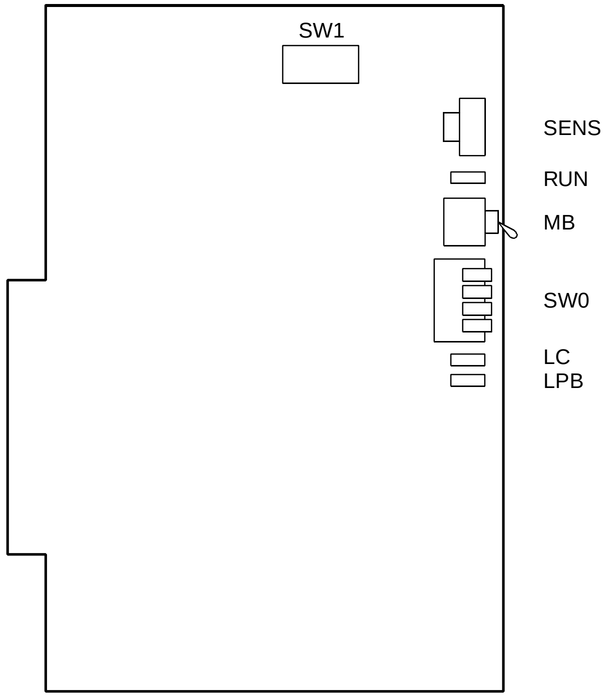
| CONDITIONS | DTI0 | | DTI1 | | DTI2 | | DTI3 | | DTI4 | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | SW 0-1 | SW 0-2 | SW 0-1 | SW 0-2 | SW 0-1 | SW 0-2 | SW 0-1 | SW 0-2 | SW 0-1 | SW 0-2 | |
| When one DTI is provided. | ON | OFF | – | – | – | – | – | – | – | – | MP card will receive the clock signal from DTI0 at its PLO0 input. |
| When more than one DTI is provided. | ON | OFF | OFF | ON | OFF | OFF | OFF | OFF | OFF | OFF | MP card will receive the clock signal from DTI0 at its PLO0 input, under normal conditions. Should a clock failure occur with DTI0, MP card will automatically switch to the PLO1 input which gets clock from DTI1. |

**NOTE 4:** When the PBX is a clock source office, set the SW0-1 and SW0-2 on all the DTI cards mounted in PIM0 to “OFF”.

**NOTE 5:** Mount the DTI card which receives a source clock signal into PIM0.

# PN-SC01 (DCH)

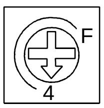
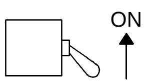
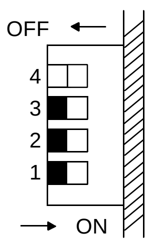
## Locations of Lamps, Switches and Connectors




## Lamp Indications

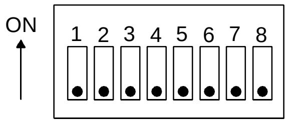
| LAMP NAME | COLOR | FUNCTION |
|---|---|---|
| RUN | Green | Flashes at 120 IPM while this card is operating normally. |
| LC | Green | Remains lit when communications are normally ongoing with the D Channel data links connected. |
| LPB | Green | Not used |

Switch Settings

| SWITCH NAME | SWITCH NUMBER | SETTING POSITION | FUNCTION | CHECK |
|---|---|---|---|---|
| SENS (Rotary SW)  **NOTE 1** | 4-F | Set the switch to match the AP Number (04-31) to be set by CM05. (see AP No. table below) | | |
| | 0-3 | Not used | | |
| MB (Toggle SW)  **NOTE 2** | | UP | For make-busy | |
| | | (DOWN) | For normal operation | |
| SW0 (Piano Key SW)  | 1 | (OFF) | Always set to OFF | |
| | 2 | (OFF) | Always set to OFF | |
| | 3 | (OFF) | Always set to OFF | |
| | 4 | ON | AP No. 04-15 | |
| | | OFF | AP No. 20-31 | |

| AP No. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AP No. | **SW0-4: ON** | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 |
| | **SW0-4: OFF** | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| **SW No.** | | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |

(Continued)

| SWITCH NAME | SWITCH NUMBER | SETTING POSITION | FUNCTION | CHECK |
|---|---|---|---|---|
| SW1 (Dip SW)  | 1 | OFF | Always set to OFF | |
| | 2 | OFF | Always set to OFF | |
| | 3 | OFF | Always set to OFF | |
| | 4 | OFF | Always set to OFF | |
| | 5 | OFF | Always set to OFF | |
| | 6 | OFF | Always set to OFF | |
| | 7 | OFF | Always set to OFF | |
| | 8 | OFF | Always set to OFF | |

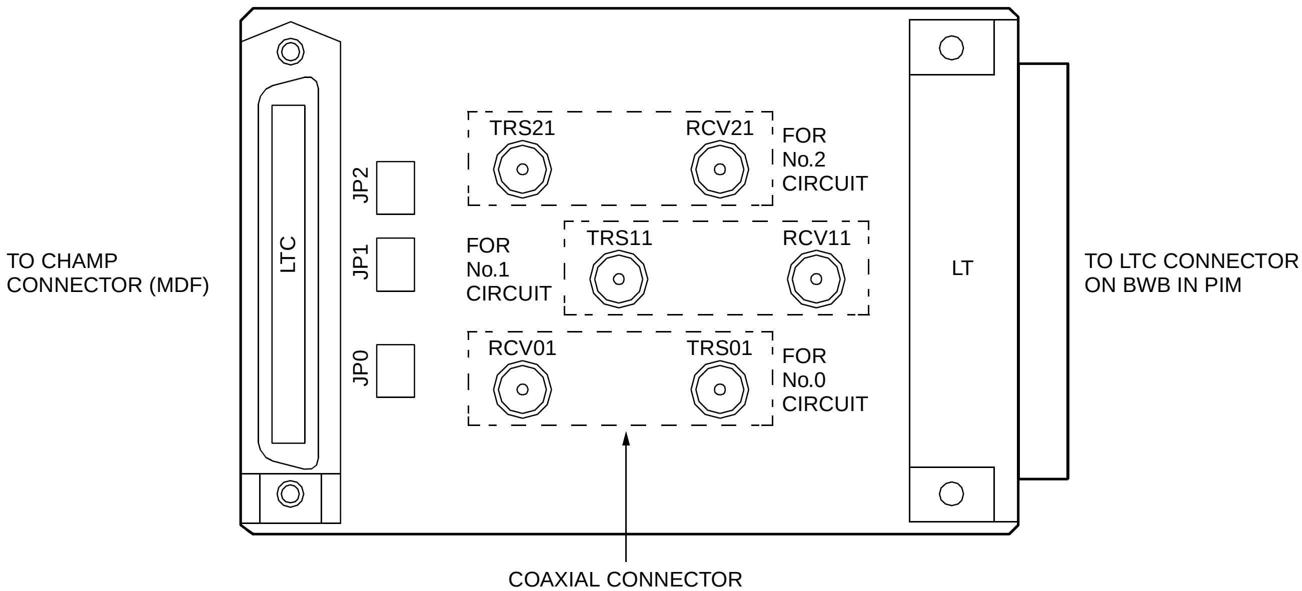
The figure in the SWITCH NAME column and the position in ( ) in the SETTING POSITION column indicate the standard setting of the switch. When the switch is not set as shown by the figure and ( ), the setting of the switch varies with the system concerned.

**NOTE 1:** Set the groove on the switch to the desired position.

**NOTE 2:** When the power is on, flip the MB switch to ON (UP position) before plugging/unplugging the circuit card.

# PZ-M542 (CONN)

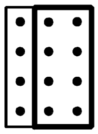
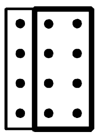
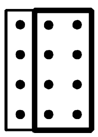
## Locations of Lamps, Switches and Connectors




## Lamp Indications

This card has no lamps.

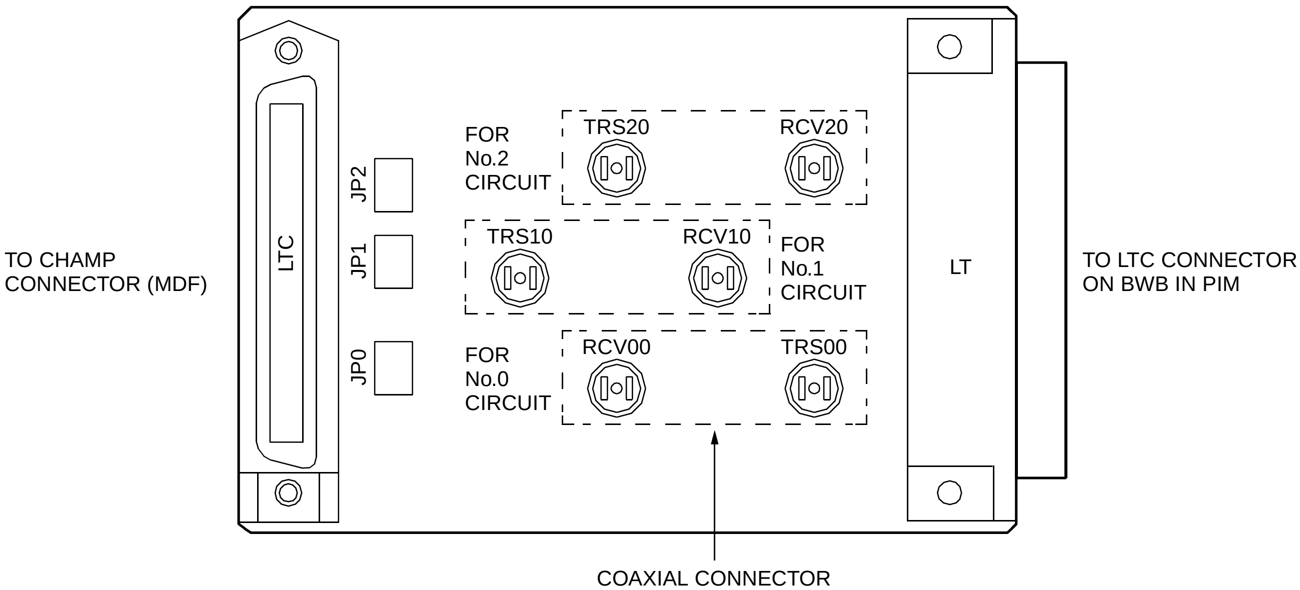
## Switch Settings

| SWITCH NAME | SWITCH NUMBER | SETTING POSITION | FUNCTION | CHECK |
|---|---|---|---|---|
| JP0  | | RIGHT | For coaxial connectors (No.0 circuit) | |
| | | LEFT | For champ connector (LT connector) (No.0 circuit) | |
| JP1  | | RIGHT | For coaxial connectors (No.1 circuit) | |
| | | LEFT | For champ connector (LT connector) (No.1 circuit) | |
| JP2  | | RIGHT | For coaxial connectors (No.2 circuit) | |
| | | LEFT | For champ connector (LT connector) (No.2 circuit) | |

The figure in the SWITCH NAME column and the position in ( ) in the SETTING POSITION column indicate the standard setting of the switch. When the switch is not set as shown by the figure and ( ), the setting of the switch varies with the system concerned.

# PZ-M557 (CONN)

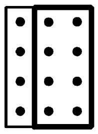
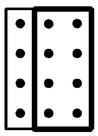
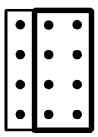
## Locations of Lamps, Switches and Connectors




## Lamp Indications

This card has no lamps.

## Switch Settings

| SWITCH NAME | SWITCH NUMBER | SETTING POSITION | FUNCTION | CHECK |
|---|---|---|---|---|
| JP0  | | RIGHT | For coaxial connectors (No.0 circuit) | |
| | | LEFT | For champ connector (LT connector) (No.0 circuit) | |
| JP1  | | RIGHT | For coaxial connectors (No.1 circuit) | |
| | | LEFT | For champ connector (LT connector) (No.1 circuit) | |
| JP2  | | RIGHT | For coaxial connectors (No.2 circuit) | |
| | | LEFT | For champ connector (LT connector) (No.2 circuit) | |

The figure in the SWITCH NAME column and the position in ( ) in the SETTING POSITION column indicate the standard setting of the switch. When the switch is not set as shown by the figure and ( ), the setting of the switch varies with the system concerned.